

# ECO STOVE

PATENT PENDING IN EUROPE,  
CANADA & USA



*Innovation in*

**Silicon Carbide**



# ECO STOVE

More than just a new stove!

A new stove that uses age old principles but with silicon carbide state-of-the art materials to maximise efficiency, create lower emissions and decrease the home's running costs. The Ecco Stove will heat the whole house without overheating the room it stands in and will project heat evenly throughout the house provided internal doors are left open.

## THE STOVE

Innovative use of Silicon Carbide as the whole structure of the stove, incorporating the unique benefits of the material produce a very high temperature in the combustion chamber (typically 900°C to 1000°C being 1652°F to 1832°F) and a catalysing effect to consume the volatile elements in the products of combustion within the Ecco Stove before they exit to atmosphere.

As a result, the efficiency of the stove is tested upto 85.3% (EU) with a Carbon output to atmosphere of only 0.24% (EU) average. The Ecco Stove efficiency satisfies DEFRA smoke control requirements (UK).

Therefore, being DEFRA exempt, the Ecco Stove can be used in inner city and smoke control areas burning wood because it combusts so perfectly.

Although the Ecco Stove is larger than many others it can be installed in a small room without overheating it because it gently projects its heat over a much larger area than a convention steel or cast stove. The room it stands in will not be hotter by more than one or two degrees than surrounding rooms (if doors are left open).

Testing has been undertaken and achieved US and Canadian safety standards. Washington and Colorado efficiency tests proving 2.1 grms/hr particulates to atmosphere and EPA exempt classification in combustion (E678 & E850 only at present). EU and CE test marking all satisfactorily completed.

E678





E850

### TEMPERATURE

The room in which the Ecco Stove stands is typically the same temperature as surrounding rooms (with connecting doors left open) as the slow radiation of heat from the appliance projects the heat evenly to those adjacent rooms to a similar temperature as the room the stove stands in.

The body temperature of the Ecco Stove is typically 200°C being 392°F (it begins catalysing at 150°C being 302°F) whereas a traditional steel or cast iron stove could be 400°C to 500°C being 752°F to 932°F meaning more intense heat, close to the traditional stove. If the choice is to heat much more of the house without over heating the room the Ecco Stove is the way forward.

Birmingham University (England) have quantified these findings in a published report in 2010.

(see a copy of this on our website)

### HEAT

The Ecco Stove has a labyrinth of flue ways and air channels constructed into the body of the appliance to extract as much heat out of the flue gas before the exhaust reaches atmosphere. This keeps pollutants down to the bare minimum. As much heat is extracted from the flue gasses as possible to heat as much of the building as possible, rather than just the room the stove stands in.

Silicon Carbide has the characteristic of absorbing heat and releasing it slowly. CE Standards tests carried out on the Ecco Stove prove it still releases 25% of its absorbed heat 7 hours (Model E850) and 12 hours (Model E678) after running up to temperature, but typically the fabric of the building is warmed and even a lower heat release will keep a well insulated building up to temperature 14 hours or more after 10 kgs being 22lbs of wood having been burned.

The stove's output is tested and verified as 4 to 11Kw. (12850 to 37550 BTUs p/h) UK and EU



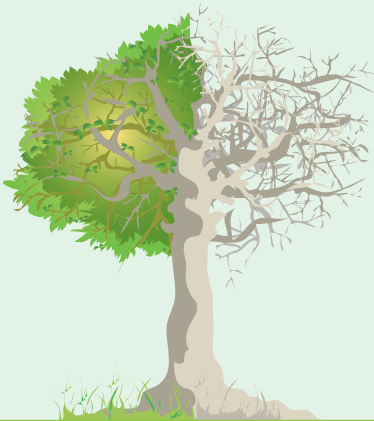
Ultra efficiency, clean burning and house heating rather than simply room heating are the Ecco Stove's contributions to reducing our need for the fuels to heat our home that create pollution and our reliance on fuel suppliers whose prices can vary without notice, or whose supply may be subject to "turning off the tap" at will.

### THE CONCEPT

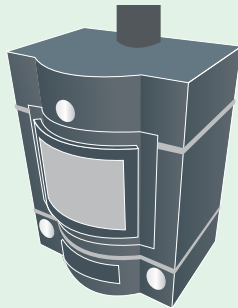
#### Co<sup>2</sup> Saving Diagram

Co<sup>2</sup> absorbed by healthy living tree.

In 5 years, a rotting tree will give off more Co<sup>2</sup> than if you burn it on the Ecco Stove.



2.1 grms/hr Washington and Colorado testing.  
0.24% Co in combustion. (EU)



### SILICON CARBIDE

As a heat emitter Silicon Carbide is a combination of two minerals extracted from the ground (Silicon and Carborundum) and fused together to produce Silicon Carbide (SiC)

The combination of the minerals provides the hardest material next to diamond, having very special properties of heat absorption and slow heat release. Currently Silicon Carbide is primarily used in electrical conductors and furnaces, until we chose it as the mineral combination to be used in our Ecco Stove (we have a patent pending covering its unique use in the Ecco Stove).

The technology we have tapped into and adapted with SiC produces some of the best efficiencies and Carbon free emissions to date.

Due to this unique application we are constantly testing and developing the material in all applications of combustion and re-combustion (gasification) to move the bounds of room and whole home heating rather than specific single room heating.

E730



# HOW IT WORKS

- A** Air is drawn into the ash pit (primary air) to rapidly heat the mass up to minimum 150°C being 302°F top centre (ideally 200°C being 392°F). When catalysing begins within the firebox.
- B** Flue gas is then deflected by a baffle system toward band b simultaneously for clean glass operation and turbulence within the combustion process.
- C** Gasification takes place via tertiary air introduction for cleanest combustion after which flue gas passes through the appliance via double pass contraflow flue ways to absorb as much heat from the flue gas before exiting to atmosphere.

## Gas Flow Diagram

**A** Primary air which is the only adjustable combustion air flow for short burn periods to bring the Ecco Stove up to design temperature for optimum performance.

**B** Secondary Air in for pre heating for glass cleaning and rolling flame pattern.

**C** Gasification System- Tertiary air in for pre heating to burn gasses rather than wood

### A. Primary Air

Cold air in.

### B. Secondary Air

Pre-heated air for clean glass operation.

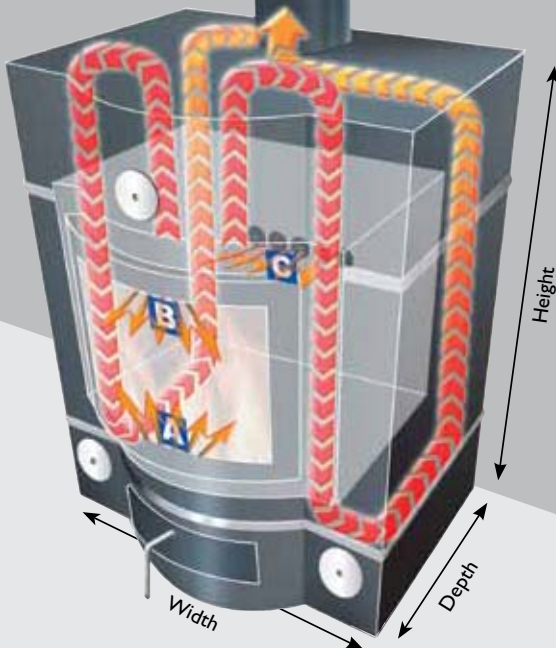
### C. Tertiary Air

Pre-heated for final re-burn within fire chamber for clean exhaust gases.

The multitude of flue ways within the Ecco Stove extract almost all heat from the gas before exhaust to atmosphere.

80-120°C 176°F-248°F under normal fire

Flue centre from rear of stove for 678 + 850 is 115mm being 4½" 580 and 730 is 143mm 5½"



# OPTIONS

## COOKING

The Ecco Stove E850 has 4 usable hotplates on its top surface. The 2 front are boiling and the two rear are simmering when the stove is up to full temperature. The Ecco E678 and E730 top is a full temperature graded hot plate.

## DOMESTIC HOT WATER (E678)

A heater coil can be added to the hotbox of the E678 for domestic hot water production, as the coil is not within the combustion chamber, the combustion efficiency is not affected.

## HEATING

The hotbox can also be used to duct warm air to other rooms by convection (increasing the height of the stove by 100mm being 4").

## COLOUR & TRIM

The Ecco Stove is available in Black or Grey paint as standard. Other colour options are available. (see below) Alloy or black trim and alloy or black front discs are available. Alloy discs for hot plates are also available.



## SPECIFICATION CHART

Model	Height	Width	Depth	Weight	Flue Diameter
<b>E580</b>	730mm	580mm	500mm	270kgs	150mm
	28 3/4"	22 3/4"	19 3/4"	595lbs	5 7/8"
	Distance to combustables				
	Rear	Top	Sides	Front	
200mm	7 7/8"	350mm	13 3/4"	125mm	4 7/8"
				350mm	13 3/4"
Distance to non - combustables					
75mm	2 7/8"	300mm	11 3/4"	125mm	4 7/8"
				300mm	11 3/4"
<b>E678</b>	878mm	678mm	525mm	550kgs	150mm
	34 1/2"	26 5/8"	20 5/8"	1212lbs	5 7/8"
	Distance to combustables				
	Rear	Top	Sides	Front	
280mm	11"	350mm	13 3/4"	430mm	17"
				400mm	15 3/4"
Distance to non - combustables					
75mm	2 7/8"	300mm	11 3/4"	125mm	4 7/8"
				300mm	11 3/4"
<b>E730</b>	1046mm	730mm	454mm	600kgs	150mm
	41 1/4"	28 3/4"	18"	1323lbs	5 7/8"
	Distance to combustables				
	Rear	Top	Sides	Front	
400mm	15 3/4"	350mm	13 3/4"	500mm	19 5/8"
				400mm	15 3/4"
Distance to non - combustables					
75mm	2 7/8"	300mm	11 3/4"	125mm	4 7/8"
				300mm	11 3/4"
<b>E850</b>	1120mm	850mm	540mm	798kgs	150mm
	44 1/8"	33 1/2"	21 1/4"	1752lbs	5 7/8"
	Distance to combustables				
	Rear	Top	Sides	Front	
500mm	19 5/8"	350mm	13 3/4"	600mm	23 5/8"
				300mm	11 3/4"
Distance to non - combustables					
75mm	2 7/8"	300mm	11 3/4"	125mm	4 7/8"
				300mm	11 3/4"
<b>Log width</b>	E580	E678	E730	E850	
	370mm	400mm	400mm	483mm	
	14 1/2"	15 3/4"	15 3/4"	19"	

E580



A move away from the traditional multi-pass contraflow flue ways with the Ecco Stove, this model E580 has created the emissions diversion and high heat extraction from the spent flue gas via a system of baffling within the model E580 and absorption into the silicon carbide.

Flue gas temperatures are lower than most stoves as the majority of heat is retained in the stoves body and baffles.

The heat produced creates more heat for much more of the house rather than over heating the room it stands within (providing doors are left open).

## THE STOVE

Innovative use of silicon carbide as the whole structure of the stove, incorporating the unique benefits of the material produce a very high temperature in the combustion chamber (typically 900-1000°C) and a catalysing effect to consume the volatile elements in the products of combustion within the Ecco Stove before they exit to atmosphere.

## WHAT DOES THIS MEAN TO ME?

As a result of high combustion temperatures, low flue gas temperatures, high heat absorption and slow heat being released, a tested efficiency of 80.4% and low carbon output to atmosphere of 0.28% The model E580 Ecco Stove heats much more of your house than just the room within which it stands (provided doors within the house are left open).

## HOW?

By using silicon carbide; a combination of minerals that filters energy, produced to emit low frequency heat waves that travel further in air rather than losing heat into objects close at hand.

Sitting in front of a stove wholly constructed of silicon carbide will typically be no hotter than 4 or 5°C more than adjacent rooms around.



# ECO STOVE

## Heating Properties

E580



### HOW IT WORKS

- A) Air is drawn in through the back of the stove for a small amount of primary combustion.
- B) By opening the ash pit drawer, primary combustion is introduced.
- C) Air is preheated in a chamber at the head of the stove to add super heated oxygen to burn down the face of the glass. This air flow is for secondary combustion and clear glass operation.
- D) Tertiary air is pre heated and added at the back of the stove to burn unburned gasses before they exit through the baffle system and thereafter release heat into the silicon carbide stove's body.

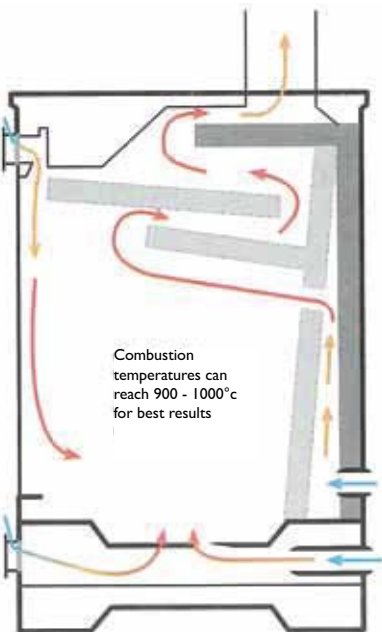
### SIMPLICITY OF USE

All air flows are pre set and non adjustable apart from primary air to be controlled via the ash pan to bring the Ecco Stove up to its design temperature of 160-180°C and then closed. No other adjustments are needed.

### TYPICAL EASE OF USE

3 kg of wood burned will typically maintain heat produced (approx 25%) when preheated to temperature for 4 to 6 hours from initial loading (subject to chimney draught).

### E580 WORKING SCHEMATIC DRAWING



Secondary Air in for pre heating for glass cleaning and rolling flame pattern.

Combustion temperatures can reach 900 - 1000°C for best results

Primary air which is the only adjustable combustion air flow for short burn periods to bring the Ecco Stove up to design temperature for optimum performance.

Rear to centre of flue 143mm

#### Gasification System

Tertiary air for pre heating to burn gasses rather than wood before they give up heat through the baffle system.

Permanent primary air in small amounts to maintain combustion.

### MODEL E850



A unique design using  
**SILICON CARBIDE**  
**SLOW HEAT RELEASE**  
(Still producing 25% heat after  
12 hours for model E678)

or

**CONSTANT**  
**WOOD BURNER**

Upto 85.3% efficient  
down to  
0.20% carbon production  
(UK & EU tests)



E678



E678

For more  
information and  
regular updates  
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Your local Ecco Stove Specialist



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Specific technical information should be sought direct from the Ecco Specialist in your area. We reserve the right to change dimensions and specifications in our product development without notice. Contact us for new developments.